

Speckled piculet *Picumnus innominatus*

1 seen in a mixed flock in BWS and a pair noticed (also in a mixed flock) at BMWS. According to Lainer, this bird has been noticed just once earlier.

Indian pitta *Pitta brachyura*

2-3 heard at CWS. Said to be found from end April to early September and a few passage migrants seen between early January and mid-March.

Spangled drongo *Dicrurus hottentottus*

10-15 birds in flight at CWS; a pair at BMWS. Said to be a scarce winter visitor in small numbers.

Ashy woodswallow *Artamus fuscus*

5-6 in CWS; 1-2 heard at BWS and 4-5 in flight at BMWS. Said to be absent from large tracts during the dry season, being a monsoon visitor.

Scarlet minivet *Pericrocotus flammeus*

A juvenile female seen begging for food at BWS.

Indian scimitar-babbler

Pomatorhinus horsfieldii

Calls heard at CWS. Recorded on the crest of the Sahyadri and, occasionally, down to an altitude of *c.* 70 m.

Grey-headed flycatcher

Culicicapa ceylonensis

1 seen at BWS. Has been recorded only twice earlier.

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37. BIRDS OF TABO: A LESSER KNOWN COLD DESERT
IN THE WESTERN HIMALAYA

The cold desert area of Tabo Valley (30° 05' N, 78° 28' E) lies *c.* 3,500 m above msl in the Spiti district, Himachal Pradesh State in northern India. This broad, flat valley is intersected by high, craggy, vertical cliffs of gray and brown sand. The higher slopes of the valley are covered with undulating alpine grasslands, which rise to the mountains, often up to the snowline or peaks (5,500-7,000 m). The boulder-strewn valley is also traversed by the River Spiti that enters through narrow gorges from the west, and flows down eastwards. The soil is alkaline (ph 7.2), poor in nutrients (K, Na, P) and organic matter (0.08%), and is silty, clayey as well as loamy (Singh and Gupta 1990).

The climate is cold and dry with heavy snowfall (*c.* 80 cm) in winter (December-March). Rainfall occurs only during September and October, and is scanty (10-15 mm). The temperature fluctuates from a maximum of 32.5 °C in August to a minimum of -32 °C in January (Kapoor and Bhagat 1990). High velocity winds blow throughout the year.

The vegetation of the area is xerophytic — dry alpine scrub, associated with soil moisture especially in the ravines and near water springs. The dominating species are *Hippophae rhamnoides*, *Rosa webbiana*, *Ephedra gerardiana*, *Caragana versicolor*, *Poa pratensis*, *Myricaria prostrata*, *Chenopodium hybridum*,

Cotoneaster falconeri, *Lonicera spinosa*, *Capparis himalayana*, *Agropyron repens*, *Eragrostis* sp., and *Trigonella* sp., (Singh and Gupta 1990; Aswal and Mehrotra 1994).

A few trees of *Juniperus macropoda* and *J. semicarpifolia* grow naturally along the Spiti river and other watercourses. Plantations of *Populus alba*, *Salix fragilis*, *S. alba* and *Robinia pseudoacacia* are also present along the roadside in Tabo, raised under the 'Desert Development Programme' in 1985 (Negi 1985). The principal crops, cultivated only in flat areas having irrigation, are barley, millet, buckwheat (*Fagopyrum* sp.), potatoes and wheat.

As there was no record of birds from Tabo Valley, a survey was carried out from December 5-12, 1992. A total of 10 sites were selected from the entire Tabo valley (5-6 sq. km). Observations were recorded daily from 0900 to 1600 hrs. Data on the overall species richness, abundance, food, feeding habits and behaviour of birds in the area were collected. Winter was delayed that year, and as a consequence there was no snowfall in Tabo, making it favourable for birds (maximum day temperature 14 °C; minimum night temperature -18 °C).

Only 13 species of birds belonging to 9 families were observed in the study area.

Golden eagle *Aquila chrysaetos* (Accipitridae): Two adults and an immature bird observed flying and calling near high cliffs on the mountainous slopes north of Tabo village. In the afternoon, an adult was noted successfully preying on a woolly hare *Lepus oiostolus*.

Bearded vulture *Gypaetus barbatus* (Accipitridae): Two adults flying low over River Spiti, between rocky gorges, 3 km west of Tabo village, along the road to Kaza.

Chukor *Alectoris chukar* (Phasianidae): A small flock of five feeding on the ground under *Salix alba* plantation at Tabo. All birds hiding in a pile of boulders after sensing a red fox *Vulpes vulpes montana*. They came out of hiding after

12 min when the threat was over. Second sighting of 7 birds feeding in fallow terraced fields in the company of more than 17 blue sheep *Pseudois nayaur*.

Hill pigeon *Columba rupestris* (Columbidae): A small flock of nine feeding on wheat grains dropped on the road between Lari and Tabo, 3 km west of Tabo village.

Yellow-billed chough *Pyrrhocorax graculus* (Corvidae): Five individuals once observed flying and circling over Tabo village.

Red-billed chough *Pyrrhocorax pyrrhocorax* (Corvidae): Observed daily, three birds seen perching on rocky slopes near Tabo village.

Dark-throated thrush *Turdus ruficollis* (Turdinae): Eight birds observed feeding on insects on the ground under a *Robinia pseudoacacia* plantation along the road.

Guldenstadt's redstart *Phoenicurus erythrogaster* (Muscicapidae): A unique sighting of a large congregation (>25 individuals), all males. These birds inhabited a flat rocky area with stones and boulders beside a stream, with many fruiting bushes of *Hippophae rhamnoides*, 4 km west of Tabo village along the road to Kaza. Each individual feeding on the fruit and guarding its bush against intruders by flying over it and displaying its territory. One bird also observed on a *Salix* tree at Tabo village.

Grey-backed shrike *Lanius tephronotus* (Laniidae): A single shrike observed perching on *Salix alba* tree in an open, boulder-strewn, plantation. Seen searching for overwintering lepidopterous immatures in crevices of boulders.

Common great rosefinch *Carpodacus rubicilla* (Fringillidae): Small parties observed daily, feeding on seeds (pods) of *Robinia pseudoacacia* in a roadside plantation. A total of 28 birds seen.

Hodgson's mountain-finch *Leucosticte nemoricola* (Fringillidae): Common (>30 birds)

around Tabo village and on rocky slopes.

Rufous-breasted accentor *Prunella strophciata* (Prunellidae): Small flocks, common in fields around Tabo village. Altogether 5 birds seen.

Tibetan snowfinch *Montifringilla adamsi* (Passerinae): Two birds once seen feeding on the ground in the vicinity of Tabo village.

The birds were identified using Ali and Ripley (1983, 1989) and Porter *et al.* (1981).

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38. OCCURRENCE OF *TRIOPS GRANARIUS* (LUCAS), CRUSTACEA: NOTOSTRACA, FROM MADURAI, TAMIL NADU

(With one text-figure)

Tadpole shrimps, considered as 'living fossils', are widely distributed in all continents except Antarctica (Whitehead 1990). The genus *Triops* has been reported from isolated localities in the Indian subcontinent (Packard 1871; Sars 1901; Kemp 1911; Walton 1911; Gurney 1925; Chacko 1950; Tiwari 1951, 1952; Longhurst 1955; Shanbhag and Inamdar 1968; Sanjeeva Raj 1971; Ghate and Shetty 1997). It is known for its intraspecific morphological variations that is, within the same species in different localities, hence it has been described under different specific names, adding to the taxonomic confusion within the genus.

This study reports the occurrence of *Triops* from Madurai, Tamil Nadu. About 20 mature

live tadpole shrimps were collected near Thirumangalam (near Latibos India), Madurai (9° 58' N, 78° 10' E) during our survey on fairy shrimps in October 1996. Sizes of both male and female range from 1.8 to 3.9 cm. Species of this group have an elongate body, oval carapace covering the head, thorax and a variable portion of the abdomen (Fig. 1a). Shape varies from round to triangular, with rounded anterior margin between eyes, whereas the posterior margin is straight and slightly emarginated. Lateral edges of carapace bear small spines and edge of rear notch has short prominent spines. Sulcus is triangular with rounded emargination and wide base. Head bears an eye on the dorsal surface and reduced second antennae. The dorsal